

Notice of Allowability	Application No.	Applicant(s)	
	10/664,164	WILSON, MARTIN	
	Examiner	Art Unit	
	Lana N. Le	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 9/17/03.
2. ☒ The allowed claim(s) is/are 1-16 and 18.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with applicant's representative, John Deluca, on 4/24/06.
3. The application has been amended as follows:
 - in claim 10, line 2, after "claim", add ---7---;
 - cancel claim 17.

REASON FOR ALLOWANCE

4. The following is an examiner's statement of reasons for allowance:

Regarding independent claim 1, Robinson (US 6,809,669) discloses a transmitter circuit (fig. 3) means comprising:

a phase lock loop (60) including a phase detector means, a summation means, and a voltage controlled oscillator arranged in series, and a controllable frequency divider arranged to feedback an output of the voltage controlled oscillator to an input of the phase detector; and

a baseband modulation source (56) arranged to generate a modulation signal corresponding to information to be transmitted;

a delta-sigma modulator means (58) arranged to receive said modulation signal and generate a delta-sigma control signal therefrom (col 5, line 10 – col 6, line 32).

Matsuura et al (US 6,784,817) disclose a modulation amplitude scaling means (1005; fig. 26) arranged to receive a modulation signal (from modulator 1004) and the modulation correction signal and to scale the amplitude of the modulation signal in response thereto (col 14, lines 26-56).

However, Robinson, Matsuura et al and the cited prior art fail to disclose:

a modulation correlation circuit means arranged to receive said modulation signal and to correlate said signal with residual modulation in the phase lock loop to generate one or more modulation correction signals; wherein the scaled modulation signal is applied to the phase lock loop at the summation means in order to modulate the voltage controlled oscillator to produce a modulated RF output signal; and

the delta-sigma control signal is applied to the controllable frequency divider in order to control the divide ratio thereof whereby the controllable frequency divider acts to substantially remove the modulation from the modulated RF output signal at the input to the phase detector.

Regarding claim 18, Breakenridge et al (EP 0,429,217) discloses a method for generating a modulated RF output signal in a phase lock loop (fig. 1) including a phase detector means (13), a summation means (17) and a voltage controlled oscillator (10) arranged in series and a controllable frequency divider (11) arranged to feedback an output to the voltage controlled oscillator (10) to an input of the phase detector (13), the method comprising the steps of:

generating a modulation signal (via 16) corresponding to information to be transmitted; and characterized by further comprising the steps of:

generating a delta-sigma control signal from the modulation signal in a delta-sigma modulator (15);

applying the modulation signal to the summation means (17) to modulate the voltage controlled oscillator (10) to produce the modulated output signal as the output of said oscillator (10),

applying the delta-sigma control signal (from 15) to the controllable frequency divider (11) in order to control the frequency divide ratio thereof; frequency dividing the modulated RF output signal in the controllable frequency divider (11) in accordance with the frequency divide ratio of the divider.

However, Breakenridge et al and the cited prior art fail to disclose:

correlating residual modulation in the phase lock loop with the modulation signal, the result of the correlation being used to generate a modulation correction signal.

scaling the modulation signal applied to the summation means in response to the modulation correction signal;

wherein said step of frequency dividing substantially removes the modulation from the RF output signal at the input of the phase detector.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Bolton, Jr. (US 6,920,182), Delta Sigma Modulator System and Method
- Morin (WO 01/11786), Hybrid Bandpass and Baseband Delta-Sigma Modulator
- Collins (US 5,337,024), Phase Locked Loop Frequency Modulation Using

Practical Division

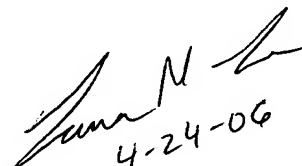
- Matsuura et al (US 2004/0,038,648), Transmitting Circuit and Wireless Communications Device.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lana N. Le whose telephone number is (571) 272-7891. The examiner can normally be reached on M-F 9:30-18:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward F. Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lana Le


4-24-06
LANA LE
PRIMARY EXAMINER